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Impact of Fetal Health Center on Mode of Neonatal Death

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Background

- There have been significant innovation and technological advancement in prenatal diagnosis, fetal therapeutic intervention, and establishment of fetal health centers (FHC) at children's hospitals with dedicated delivery services for high-risk neonates and expedited access to level IV neonatal intensive care units (NICU).
- Mortality trends have been examined on individual bases and within diagnostic groups, but there have been few studies that examine overall modes of mortality in the NICU population across diagnoses after the implementation of a dedicated FHC. This study aims to compare modes of death at a level IV children's hospital NICU between infants born at the fetal health center (inborn) and those transferred from referral centers (outborn).

Methods

- Patients who died at the Children's Mercy Hospital NICU from January 2012-December 2022 (FHC deliveries started in 2011)
- Retrospective chart review
- Data collected on place of birth and mode of death (CPR within six hours of death, withholding of potential interventions, or withdrawal of existing interventions).
- Results evaluated with a 2-tailed z test

Figure 2: Modes of Death
Outborn births

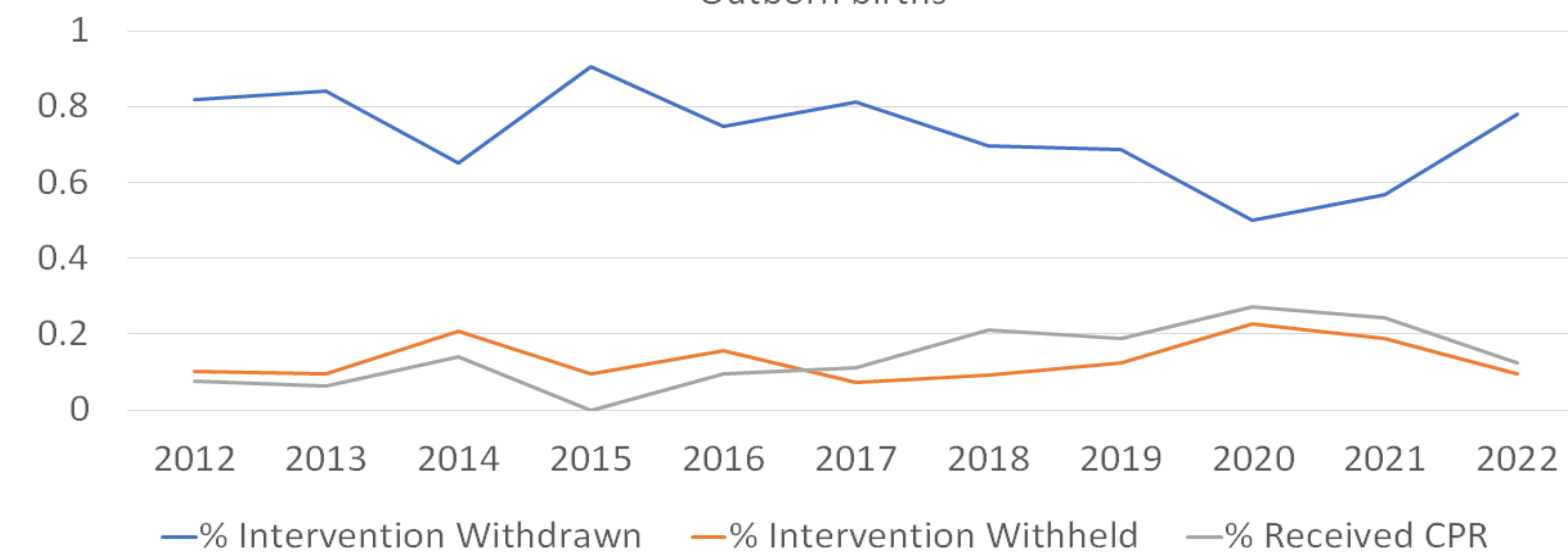
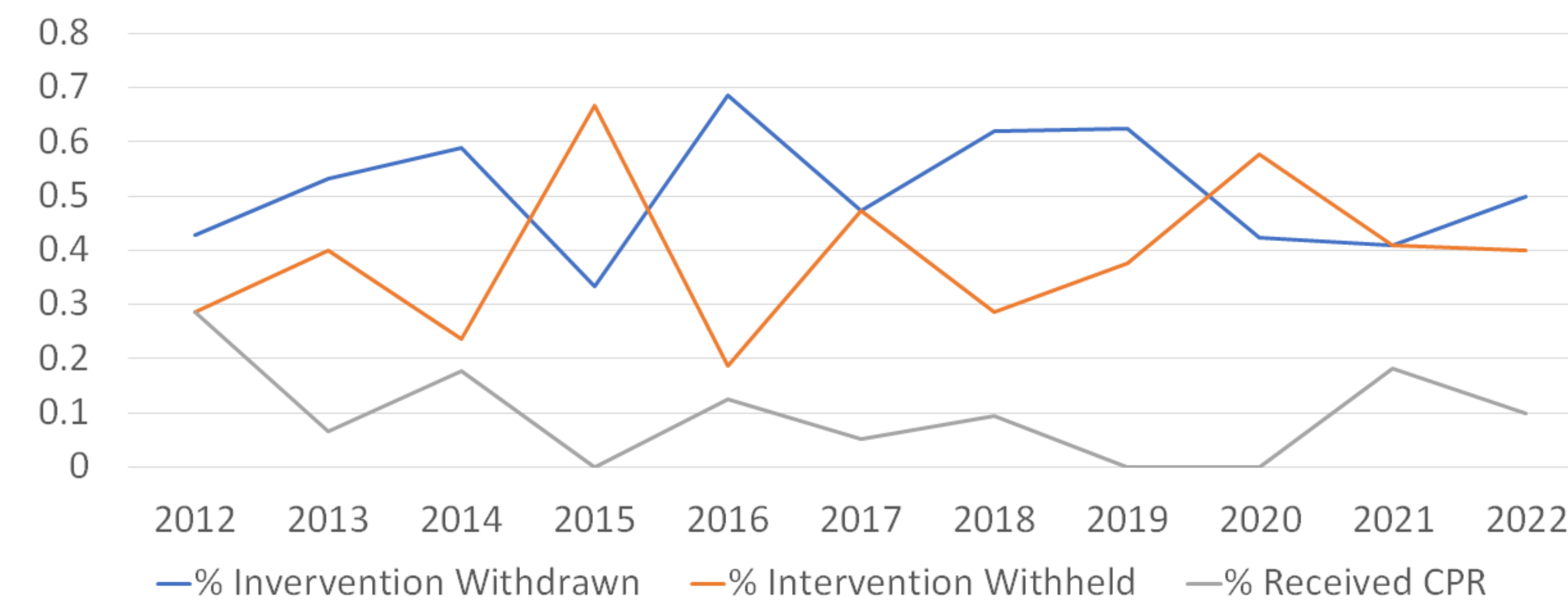


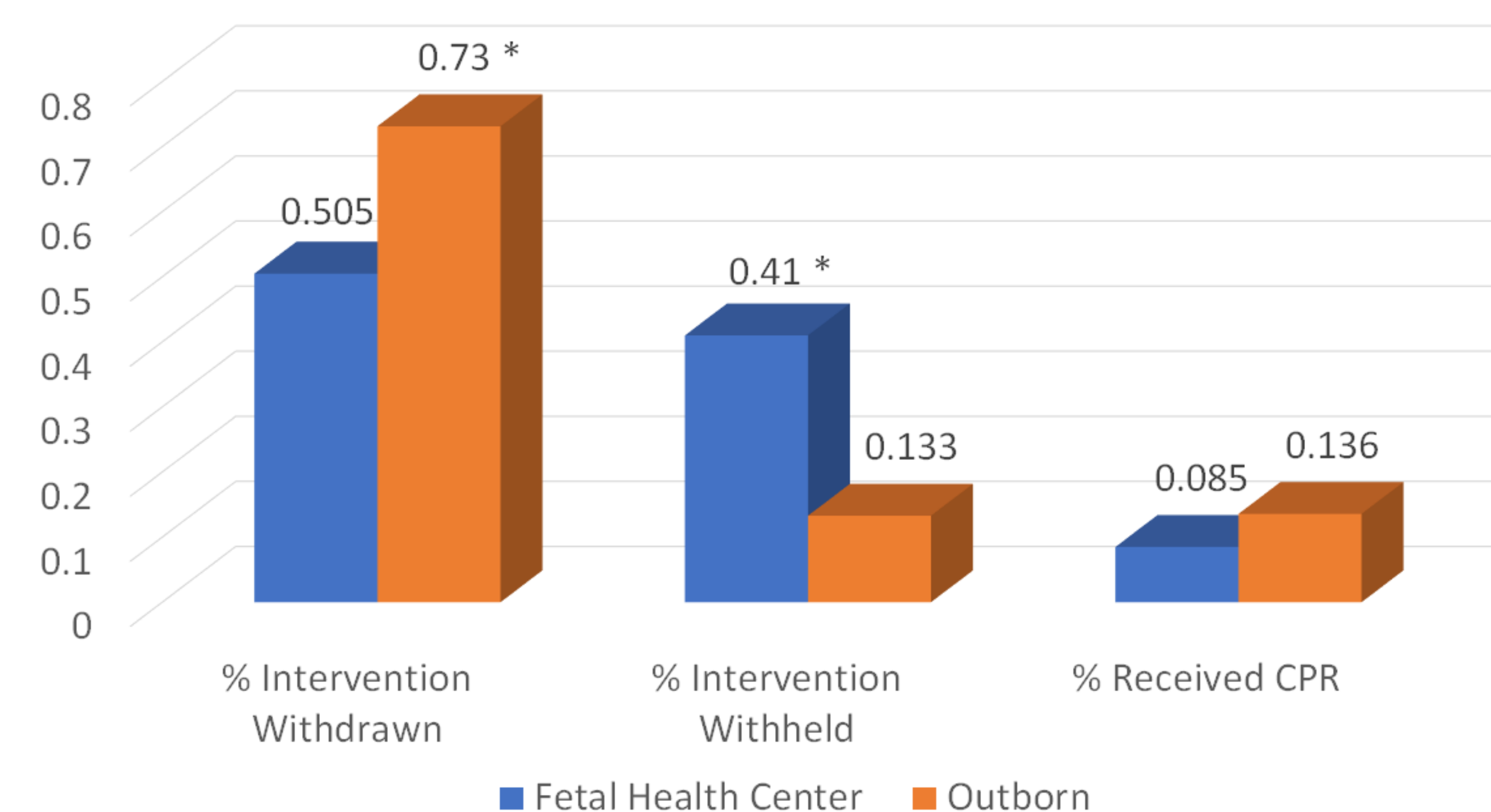
Figure 1: Modes of Death
Fetal Health Center births



Results

- 11-year study period with 10,862 admissions and 563 (5.2%) deaths
- Data were available for 561 deaths, including all inborn deaths
- Of the deaths, 35.6% were inborn, 64.5% outborn
- Of total admissions, 1,857 (17%) were inborn with 200 (10.7%) deaths
- Outborn infants accounted for 9,005 admissions with 363 (4%) deaths
- Significant difference in inborn and outborn babies in both interventions withdrawn and interventions withheld

Figure 3: Modes of Death, 2012-2022



Discussion

- The data demonstrate a significant difference in the percentage of withdrawal of intervention and withholding of intervention as the primary mode of death between inborn and outborn infants. This could be secondary to initial stabilization at outside hospitals prior to transport or indicate differences in the underlying diagnoses. This could also be secondary to inborn births receiving extensive prenatal counselling at the FHC with a do not resuscitate (DNR) at birth or limited intervention plan already in place.
- Further analyses based on diagnoses and type of birth plan will be undertaken. The presence of immediate post-natal withholding of care will be further evaluated with multivariate analysis based on age of death. Year-by-year data also demonstrates a trend of increased rates of CPR prior to death in the outborn group.
- FHC programs focus on congenital abnormalities that are amenable to prenatal diagnosis which may lead to an overrepresentation of devastating congenital abnormalities in this group. Further multivariate analysis will be undertaken to assess if this or other variables may be responsible for the differences found.

Conclusion

- Inborn newborns born at a fetal health center had a higher mortality compared to outborn infants and were more likely than outborn infants to have interventions held in the immediate pre-mortem period
- Difference for receiving CPR within 6 hours of death approached but did not reach significance
- Further research and multivariate analysis is needed to see if this is secondary to differences in underlying diagnoses, gestational age at birth, improved prenatal counseling at a FHC or some combination of the above